

ABSTRACT

A gain-clamped semiconductor optical amplifier having photo detectors which are integrated on a single crystal substrate can detect optical intensities at input/output terminals of the optical amplifier. The semiconductor optical amplifier includes a first
5 conductive semiconductor substrate, a semiconductor optical amplifier formed on the semiconductor substrate so as to have a horizontal-direction lasing structure, and a first and a second photo detector formed respectively at positions of the semiconductor substrate spaced horizontally from an input side and an output side of the semiconductor optical amplifier so as to measure intensities of an input signal and an output signal of the
10 semiconductor optical amplifier.